ODEN VIEW ESTATES IMPROVEMENT ASSOCIATION (PWSNO 1090091)
SOURCE WATER ASSESSMENT REPORT

August 6, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This risk assessment is based on a land use inventory in the well recharge zone, sensitivity factors associated with how the well was constructed, and aquifer characteristics.

This report, *Source Water Assessment for Oden View Estates Improvement Association*, describes the public drinking water well; the well recharge zone and potential contaminant sites located inside the recharge zone boundaries. This assessment, taken into account with local knowledge and concerns, should be used as a planning tool to develop and implement appropriate protection measures for this public water system. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

Oden View Estates Improvement Association drinking water is supplied by a 500-foot deep well pumping from a small aquifer near Oden Bay on the north side of Lake Pend Oreille. The water system serves 15 residential connections in a rural neighborhood. Historically, Oden View Estates has had few water quality problems. A groundwater Susceptibility Analysis DEQ conducted May 23, 2002 ranked the well moderately susceptible to microbial contamination and at low risk relative to all other classes of regulated contaminants.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Oden View Estates Improvement Association already employs some important drinking water protection measures since it is operated and maintained in substantial compliance with *Idaho Rules for Public Drinking Water Systems.* The system needs to obtain a lease from Montana Rail-Link for the area within 50 feet of the well that is part of the railroad right of way. Securing authority to regulate all activity on the well lot should be the association's top priority for drinking water protection.

Because the water system does not have jurisdiction over the entire recharge zone delineated for its well it will be important to establish partnerships with neighboring landowners to regulate land uses and activities that have the potential to degrade ground water quality. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term.

For assistance in developing protection strategies, please contact your regional Department of Environmental Quality office or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR ODEN VIEW ESTATES IMPROVEMENT ASSOCIATION

Section 1. Introduction - Basis for Assessment

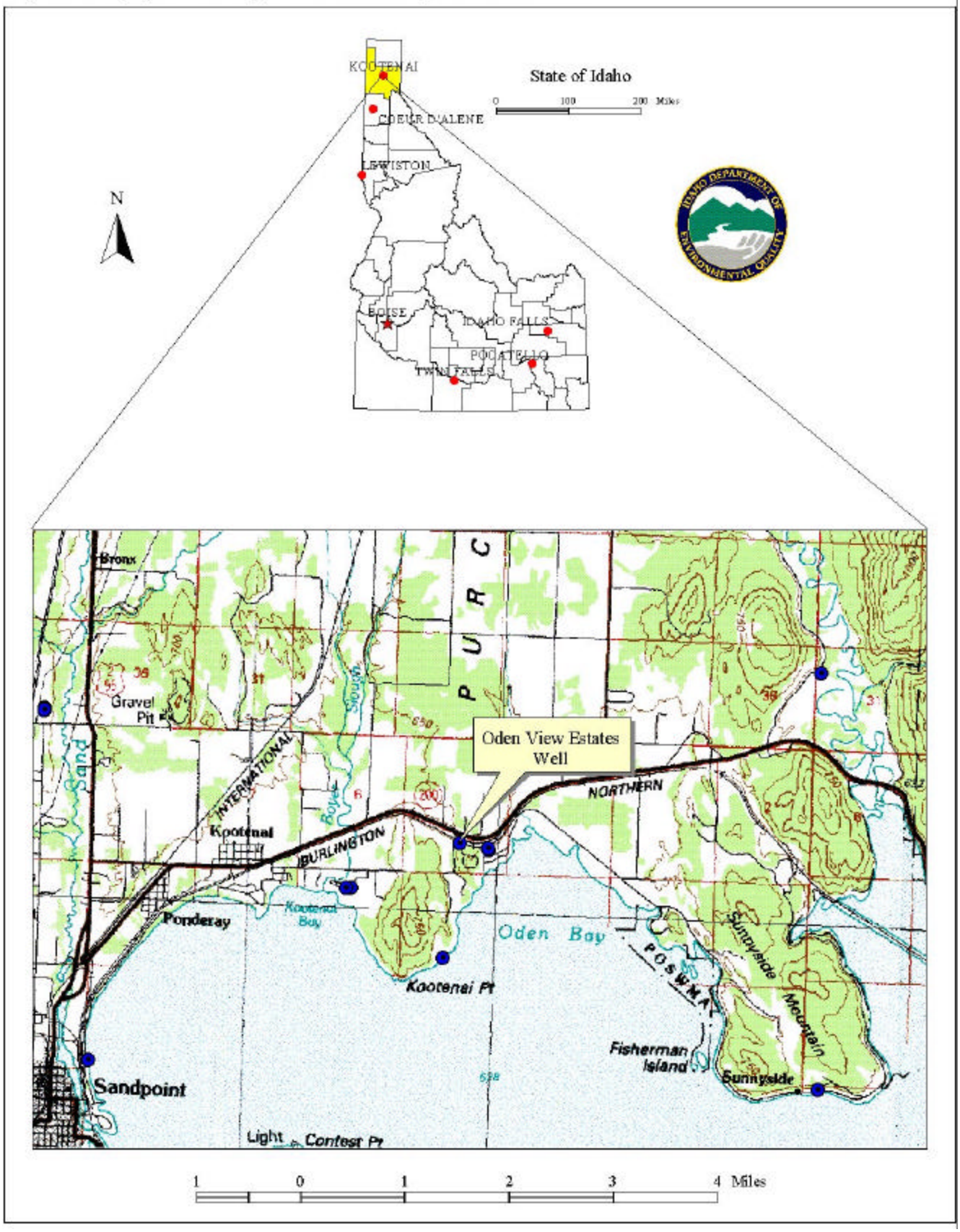
The following sections contain information necessary for understanding how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and an inventory of significant potential sources of contamination identified within that area are included. The ground water susceptibility analysis worksheets used to develop this assessment are attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the U.S. Environmental Protection Agency (EPA) to assess every public drinking water source in Idaho for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. These assessments are based on a land use inventory inside the delineated recharge zones, sensitivity factors associated with how the well is constructed, and aquifer characteristics. The state must complete more than 2900 assessments by May of 2003. Because resources and the time available to accomplish assessments are limited, an in-depth, site-specific investigation for every public water system is not possible.

The results of the source water assessment should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system. The ultimate goal of this assessment is to provide data to local communities for developing a protection strategy for their drinking water supply. The Idaho Department of Environmental Quality recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Figure 1. Geographic Location of Oden View Estates Improvement Association



Section 2. Preparing for the Assessment

Defining the Zones of Contribution - Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the well recharge area into time of travel zones indicating the number of years necessary for a particle of water to reach a well. DEQ used a refined computer model approved by the EPA to determine the extent of well recharge zones for community water systems. The computer model used data assimilated by DEQ from a variety of sources including local well logs.

Oden View Estates Improvement Association serves a community of about 27 year-round residents in a rural neighborhood 3 miles east of Kootenai, Idaho (Figure 1). Drinking water for Oden View Estates Improvement Association customers is supplied by a 500-foot deep well. When it was first drilled, the well produced about 36 gpm, but its capacity has declined since 1992 to 19 gpm. The old well, about 30 feet south of Well #2, was abandoned due to lack of capacity.

The delineated source water assessment area for Oden View Estates Improvement Association Well #2 is about 0.7 miles long and covers 17.3 acres. It is divided into 0-3, 3-6 and 6-10 year time of travel zones. The primary direction of ground water flow is from northwest to southeast (Figure 2).

Identifying Potential Sources of Contamination

The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. Inventories for public water systems in Idaho were conducted in two-phases. The first phase involved identifying and documenting potential contaminant sources within the source water assessment areas through the use of computer databases and Geographic Information System maps developed by DEQ. The maps and inventory lists were then sent to system operators for verification and correction in the second or enhanced part of the inventory process.

Figure 2, *Oden View Estates Improvement Association Delineation and Potential Contaminant Inventory* on page 7 of this report shows the location of the Oden View Estates Improvement Association well, the recharge zone delineation and potential contaminant sites in the vicinity. Land use in the recharge zone is a mix of suburban residential with agriculture.

Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. When a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation.

Section 3. Susceptibility Analysis

The susceptibility to contamination of all groundwater sources in Idaho is being assessed on the following factors:

- physical integrity of the well,
- hydrologic characteristics,
- land use characteristics, and potentially significant contaminant sources
- historic water quality

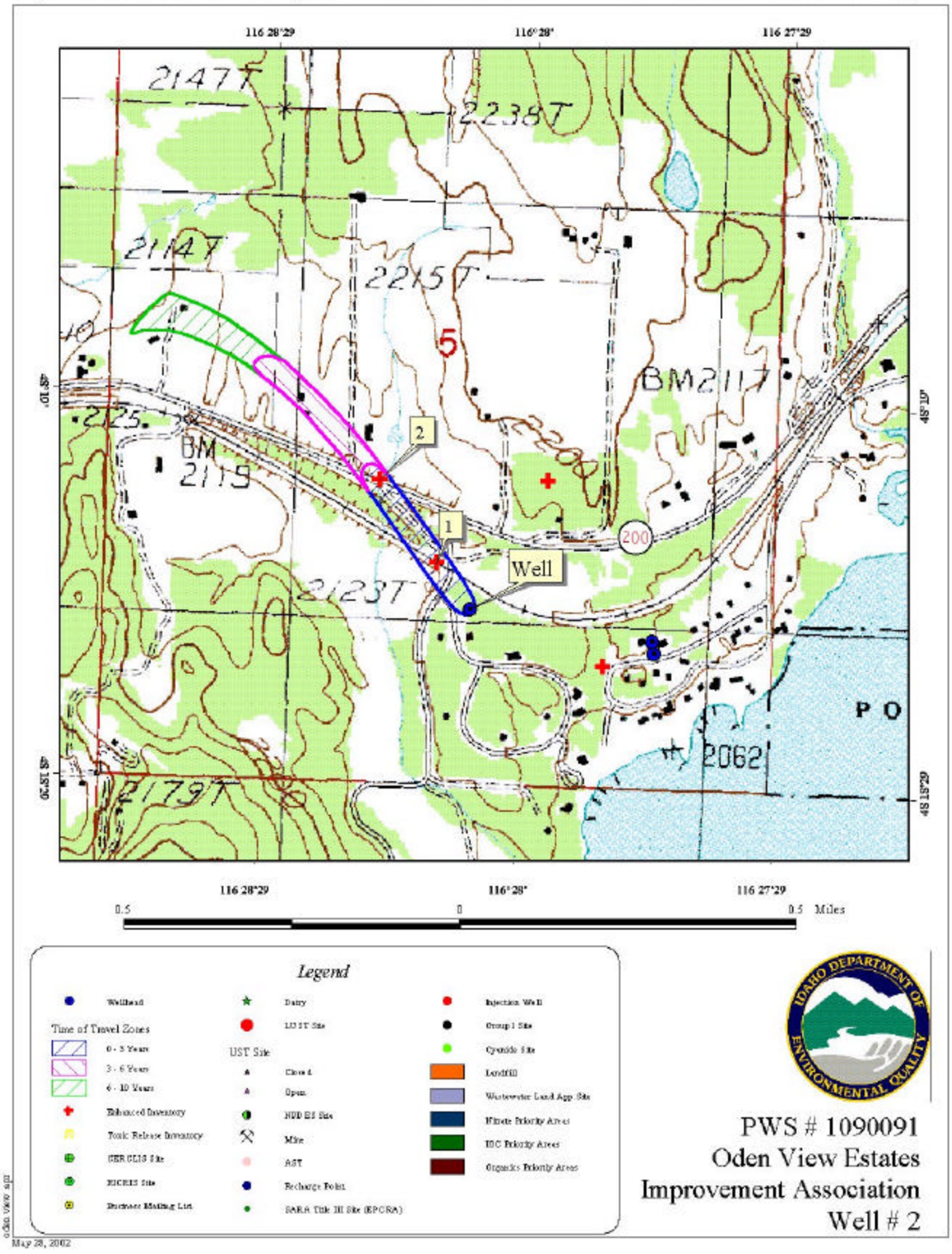
The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. A high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking. The Susceptibility Analysis Worksheets in Attachment A show in detail how the Oden View Estates Improvement Association wells scored.

Well Construction

Well construction features directly affect the ability of a well to protect the aquifer from contaminants. Lower scores imply a well that can better protect the water. This portion of the susceptibility analysis relies on information from individual well logs and from the most recent sanitary survey of the public water system. The Oden View Estates Improvement Association water system was last inspected on June 17, 1998. No deficiencies in wellhead or surface seal maintenance were noted at the time of the survey. The well log is on file with DEQ.

Well #2 was drilled in December 1991 to a depth of 500 feet. The 6-inch steel casing extends from 2 feet above ground to 18 feet below. The surface seal is also 18 feet deep, terminating in a layer of hard gray shale. Water was encountered in a fracture zone from 395 to 500 feet. The well has a 4-inch PVC liner that is perforated between 260 to 480 feet. The static water level is 96 feet below the surface.

Figure 2. Oden View Estates Improvement Association Delineation and Potential Contaminant Inventory.



Hydrologic Sensitivity

The hydrologic sensitivity score for the Oden View Estates Improvement Association well was 3 points out six points possible. This score reflects geologic conditions in the recharge zone as a whole and at the well site. Soils in the recharge zone for the Oden View well are classified as moderately well drained. Poorly drained to moderately well drained soils are deemed more protective of ground water than soils which drain faster. At the well site, 13 feet of clay and broken shale cover solid shale strata located above the water bearing fracture zone starting 395 feet below ground.

Potential Contaminant Sources and Land Use

Land use in the Oden View Estates well recharge zone is a mix of suburban homes with farm and ranch land. The rail line and Highway 200, crossing the 0-3 year time of travel zone delineated for the well, are numbered separately on Figure 2 and on the table below, but were counted as a single source in the Susceptibility Analysis. The rail line itself is about 200 feet from the well, but the right of way overlaps the 50-foot sanitary setback zone encircling the well. The highway crosses the delineation boundary about 1000 feet from the well.

Table 1. Oden View Estates Improvement Association Potential Contaminant Inventory

MAP ID NUMBER	SITE DESCRIPTION	POTENTIAL CONTAMINANTS[1]	TIME OF TRAVEL ZONE	SOURCE OF INFORMATION
1	Rail Line	IOC, SOC, VOC Microbial	0-3,	Geological Survey Map
2	Highway 200	IOC, SOC, VOC Microbial	0-3	Geological Survey Map

Historic Water Quality

Historically, Oden View Estates has had few water quality problems. The system tests monthly for the presence of total coliform bacteria. Samples from the cistern and distribution system were positive in November 1995. Total coliform bacteria were absent from samples tested subsequently. Oden View Estates chlorinates its water as it enters the reservoir.

Chemical and radiological test results are summarized on the table below. The volatile organic chemicals Bromodichloromethane, Chlorodibromomethane and, Chloroform belong to a class of compounds called Trihalomethanes. They are formed as byproducts of disinfection with chlorine. Detection of these compounds does not count against the well in the Susceptibility Analysis since their presence is not indicative of ground water contamination.

Table 2. Oden View Estates Improvement Association Chemical and Radiological Test Results

Primary IOC Contaminants (Mandatory Tests)							
Contaminant	MCL (mg/l)	Results (mg/l)	Dates	Contaminant	MCL (mg/l)	Results (mg/l)	Dates
Antimony	0.006	ND	11/19/92 to 10/2/01	Nitrate	10	ND to 0.012	11/19/92 to 10/2/01
Arsenic	0.01	ND	11/19/92 to 10/2/01	Nickel	N/A	ND	11/19/92 to 10/2/01
Barium	2.0	ND	11/19/92 to 10/2/01	Selenium	0.05	ND	11/19/92 to 10/2/01
Beryllium	0.004	ND	11/19/92 to 10/2/01	Sodium	N/A	13.5 to 19	11/19/92 to 10/2/01
Cadmium	0.005	ND	11/19/92 to 10/2/01	Thallium	0.002	ND	11/19/92 to 10/2/01
Chromium	0.1	ND	11/19/92 to 10/2/01	Cyanide	0.02	ND	11/19/92 to 10/2/01
Mercury	0.002	ND	11/19/92 to 10/2/01	Fluoride	4.0	0.5, 0.11	10/2/01, 11/19/92

Secondary and Other IOC Contaminants (Optional Tests)			
Contaminant	Recommended Maximum (mg/l)	Results (mg/l)	Dates
Manganese		0.03	11/19/92
Sulfate		56.0 to 78.2	11/19/92, 10/2/01
Zinc		0.25	11/19/92

Regulated and Unregulated Synthetic Organic Chemicals		
Contaminant	Results	Dates
29 Regulated and 13 Unregulated Synthetic Organic Compounds	None Detected	8/19/93- 10/2/01

Regulated and Unregulated Volatile Organic Chemicals		
Contaminant	Results	Dates
21 Regulated And 16 Unregulated Volatile Organic Compounds	None Detected except as noted below	11/19/92 -6/15/98
Bromodichloromethane	0.84 µg/l to1.3 µg/l	11/19/92 to 6/15/98
Chlorodibromomethane	0.6 µg/l, 0.84 µg/l	8/19/93, 6/15/98
Chloroform	1.3 µg/l , 2.3 µg/l	11/19/92, 8/19/93
Total Trihalomethanes (TTHM) (MCL = 100 µg/l)	1.57 to 4.1 µg/l	11/19/92 to 6/15/98

Radiological Contaminants			
Contaminant	MCL	Results	Dates
Gross Alpha, Including Ra & U	15 pC/l	7.0 to 12.1 pC/l	11/19/92 to 10/2/01
Gross Beta Particle Activity	4 mrem/year	4.8 to 8.5 mrem 4.1 pC/l	11/19/92 to 7/15/97 10/2/01

ND = none detected

Final Susceptibility Ranking

The Oden View Estates Improvement Association well ranked moderately susceptible to microbial contamination and is at low risk relative to other classes of regulated contaminants. Risk factors associated with local geology added the most points to the final susceptibility scores. Final susceptibility scores and rankings for each category of regulated contaminants are summarized on Table 3. The complete analysis worksheet for the well is in Attachment A.

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)
2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

The final ranking categories are as follows:

- 0 - 5 Low Susceptibility
- 6 - 12 Moderate Susceptibility
- > 13 High Susceptibility

Table 3. Summary of Oden View Estates Improvement Association Susceptibility Evaluation

Final Susceptibility Scores/ Ranking				
	IOC	VOC	SOC	Microbial
Well #2	5/Low	5/Low	5/Low	6/Moderate

IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

Oden View Estates Improvement Association already employs some significant drinking water protection measures since it is operated and maintained in substantial compliance with *Idaho Rules for Public Drinking Water Systems.* The June 1998 Sanitary Survey said Oden View Estates needs to get a lease for the portion of the well lot impinging on the Montana Rail-Link right of way or alternatively, to apply for a waiver of sanitary setback requirements. Leasing the land would give the Association complete authority to regulate use or storage potential contaminants such as herbicides within 50 feet of the well.

Oden View should consider covering the well head and fencing the area around it for security reasons and to control activities that could inadvertently cause contamination. Guidelines for protecting public drinking water systems through increased security measures are available on the DEQ website, www2.state.id.us/deq/water/water1.htm.

Every public water system should develop a drinking water emergency response plan. There is a simple fill-in-the-blanks form available on the website mentioned above to guide systems through the emergency planning process.

Because Oden View Estates Improvement Association does not have jurisdiction over the entire recharge zone delineated for its wells it will be important to establish partnerships with neighboring landowners to regulate land uses and activities that have the potential to degrade ground water quality. Some of them may not be aware that their property is in a sensitive area where household, agricultural or business practices could have a negative impact on nearby wells. Oden View Estates should consider promoting programs like Home*A*Syst or Farm*A*Syst in the well recharge zone. These voluntary programs help people assess environmental risks on their property and find technical support for making needed changes.

Public education is an important component of a drinking water protection plan. Oden View Estates already uses its annual consumer confidence report to promote water conservation. It might also be useful for the system to sponsor a water conservation workshop in conjunction with the Bonner County University of Idaho Extension office.

Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term

Assistance

Public water suppliers and users may call the following IDEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the IDEQ office for preliminary review and comments.

Coeur d'Alene Regional DEQ Office (208) 769-1422

State IDEQ Office (208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper of the Idaho Rural Water Association (208) 343-7001for assistance with drinking water protection strategies.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

Idaho Department of Agriculture, 1998. Unpublished Data.

Idaho Division of Environmental Quality, 1994. Ground Water and Soils Reconnaissance of the Lower Payette Area, Payette County, Idaho. Ground Water Quality Technical Report No. 5. Idaho Division of Environmental Quality. December 1994.

Idaho Division of Environmental Quality, 1996. Lower Payette River Agriculture Irrigation Water Return Study and Ground Water Evaluation, Payette County, Idaho. Water Quality Status Report No. 115.

Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

Idaho Department of Environmental Quality, 2000. City of Fruitland Wellhead Viability Project 319 Grant Final Report July 2000.

Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Natural Resource Conservation Service, 1991. Idaho Snake-Payette Rivers Hydrologic Unit Plan of Work. March 1991.

United States Geological Survey, 1986. Quality of Ground Water in the Payette River Basin, Idaho. United States Geological Survey. Water Resources Investigation Report 86-4013.

University of Idaho. 1986. Ground Water Resources in a Portion of Payette County, Idaho. Idaho Water Resources Research Institute. University of Idaho. Moscow, Idaho. April 1986.

Attachment A

Oden View Estates Improvement Association Susceptibility Analysis Worksheet

Ground Water Susceptibility

Public Water System Name : **ODEN VIEW ESTATES IMPROVEMENT ASSN** Source: **WELL #2**

Public Water System Number : **1090091** 5/28/02 9:44:40 AM

1. System Construction		SCORE			
Drill Date	12/3/91				
Driller Log Available	YES				
Sanitary Survey (if yes, indicate date of last survey)	YES 1998				
Well meets IDWR construction standards	NO	1			
Wellhead and surface seal maintained	YES	0			
Casing and annular seal extend to low permeability unit	YES	0			
Highest production 100 feet below static water level	YES	0			
Well located outside the 100 year flood plain	YES	0			
Total System Construction Score		**1**			
2. Hydrologic Sensitivity					
Soils are moderately drained	YES	1			
Vadose zone composed of gravel, fractured rock or unknown	NO	0			
Depth to first water > 300 feet	YES	0			
Aquitard present with > 50 feet cumulative thickness	NO	2			
Total Hydrologic Score		**3**			
		IOC	VOC	SOC	Microbial
3. Potential Contaminant / Land Use - ZONE 1A (Sanitary Setback)		Score	Score	Score	Score
Land Use Zone 1A	DRYLAND AGRICULTURE	1	1	1	1
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		**1**	**1**	**1**	**1**
Potential Contaminant / Land Use - ZONE 1B (3 YR. TOT)					
Contaminant sources present (Number of Sources)	MAJOR TRANSPORTATION CORRIDOR	1	1	1	1
(Score = # Sources X 2) 8 Points Maximum		2	2	2	2
Sources of Class II or III leacheable contaminants or Microbials	YES	1	1	1	
4 Points Maximum		1	1	1	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	25 to 50% Non-Irrigated Agricultural Land	1	1	1	1
Total Potential Contaminant Source / Land Use Score - Zone 1B		**4**	**4**	**4**	**3**
Potential Contaminant / Land Use - ZONE II (6 YR. TOT)					
Contaminant Sources Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
Land Use Zone II	25 to 50% Non-Irrigated Agricultural Land	1	1	1	
Potential Contaminant Source / Land Use Score - Zone II		**1**	**1**	**1**	**0**
Potential Contaminant / Land Use - ZONE III (10 YR. TOT)					
Contaminant Source Present	NO	0	0	0	
Sources of Class II or III leacheable contaminants or Microbials	NO	0	0	0	
Do irrigated agricultural lands occupy > 50% of Zone	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		**0**	**0**	**0**	**0**
Cumulative Potential Contaminant / Land Use Score		**6**	**6**	**6**	**4**
4. Final Susceptibility Source Score		**5**	**5**	**5**	**6**
5. Final Well Ranking		Low	Low	Low	Moderate

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

BML (Business Mailing List)– This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as Superfund is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

Closed Or Open UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.